

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

VOICEAGE EVS LLC,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 19-1945-GBW
	)	
HMD GLOBAL OY,	)	
	)	
Defendant.	)	

**OPENING BRIEF IN SUPPORT OF HMD GLOBAL OY'S  
MOTION FOR JUDGMENT ON THE PLEADINGS**

OF COUNSEL:  
William J. McCabe  
Matthew J. Moffa  
Thomas V. Matthew  
Matthew A. Lembo  
PERKINS COIE LLP  
1155 Avenue of the Americas, 22nd Floor  
New York, NY 10036-2711  
(212) 262-6900

Samantha Hunt  
PERKINS COIE LLP  
1201 Third Avenue, Suite 4900  
Seattle, WA 98101-3099  
(206) 359-8000

Roderick O'Dorisio  
PERKINS COIE LLP  
1900 Sixteenth Street, Suite 1400  
Denver, CO 80202  
(303) 291-2303

John W. Shaw (No. 3362)  
Nathan R. Hoeschen (No. 6232)  
SHAW KELLER LLP  
I.M. Pei Building  
1105 North Market Street, 12th Floor  
Wilmington, DE 19801  
(302) 298-0700  
jshaw@shawkeller.com  
*Attorneys for Defendant*

Olivia S. Radics  
PERKINS COIE LLP  
33 East Main Street, Suite 201  
Madison, WI 53703-3095  
(608) 663-7460

Dated: February 29, 2024

## TABLE OF CONTENTS

<b>I.</b>	<b>INTRODUCTION AND SUMMARY OF ARGUMENT .....</b>	<b>1</b>
<b>II.</b>	<b>NATURE AND STAGE OF THE PROCEEDINGS AND STATEMENT OF FACTS .....</b>	<b>2</b>
<b>A.</b>	<b>The '073 Patent .....</b>	<b>3</b>
1.	Overview .....	3
2.	Prosecution History .....	4
<b>B.</b>	<b>The '741 Patent .....</b>	<b>4</b>
1.	Overview .....	4
2.	Prosecution History .....	5
<b>III.</b>	<b>LEGAL STANDARDS .....</b>	<b>6</b>
<b>A.</b>	<b>Judgment On the Pleadings Under Rule 12(c) .....</b>	<b>6</b>
<b>B.</b>	<b>Patent Eligibility Under § 101 .....</b>	<b>7</b>
<b>IV.</b>	<b>ARGUMENT .....</b>	<b>8</b>
<b>A.</b>	<b>The '073 Patent Is Invalid Under § 101 .....</b>	<b>8</b>
1.	<i>Alice</i> Step One: Estimating “Tonal Stability” Using Math Is an Abstract Idea .....	8
2.	<i>Alice</i> Step Two: The Claims Add Nothing But Patent-Ineligible Math and Generic Computers .....	13
<b>B.</b>	<b>The '741 Patent Is Invalid Under § 101 .....</b>	<b>14</b>
1.	<i>Alice</i> Step One: Converting Sampling Rates and Encoding Parameters are Abstract Ideas .....	14
2.	<i>Alice</i> Step Two: The Claims Do Not Recite “Significantly More” .....	17
<b>V.</b>	<b>CONCLUSION .....</b>	<b>18</b>

## TABLE OF AUTHORITIES

### Cases

<i>Adaptive Streaming Inc. v. Netflix, Inc.</i> , 836 F. App'x 900 (Fed. Cir. 2020).....	15
<i>Alice Corp. Pty. Ltd. v. CLS Bank Int'l</i> , 573 U.S. 208 (2014).....	7, 8
<i>Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada (U.S.)</i> , 687 F.3d 1266 (Fed. Cir. 2012).....	12, 13
<i>buySAFE, Inc. v. Google, Inc.</i> , 765 F.3d 1350 (Fed. Cir. 2014).....	7
<i>CardioNet, LLC v. InfoBionic, Inc.</i> , 816 F. App'x 471 (Fed. Cir. 2020).....	10, 14
<i>CG Tech. Dev., LLC v. FanDuel, Inc.</i> , 442 F. Supp. 3d 840 (D. Del. 2020) .....	7
<i>Data Engine Techs. LLC v. Google LLC</i> , 906 F.3d 999 (Fed. Cir. 2018).....	8
<i>Diamond v. Diehr</i> , 450 U.S. 175 (1981) .....	9
<i>Electric Power Group, LLC v. Alstom S.A.</i> , 830 F.3d 1350 (Fed. Cir. 2016).....	passim
<i>Enfish, LLC v. Microsoft Corp.</i> , 822 F.3d 1327 (Fed. Cir. 2016).....	9
<i>Gottschalk v. Benson</i> , 409 U.S. 63 (1972) .....	9
<i>In re Bd. of Trs. of Leland Stanford Junior Univ.</i> , 991 F.3d 1245 (Fed. Cir. 2021).....	1, 7, 10, 16
<i>In re Gitlin</i> , 775 F. App'x 689 (Fed. Cir. 2019).....	18
<i>In re Gopalan</i> , 809 F. App'x 942 (Fed. Cir. 2020).....	16
<i>In re Killian</i> , 45 F.4th 1373 (Fed. Cir. 2022).....	11, 17

<i>In re Richman</i> , 563 F.2d 1026 (C.C.P.A. 1977).....	14
<i>Int’l Bus. Machs. Corp. v. Groupon, Inc.</i> , 289 F. Supp. 3d 596 (D. Del. 2017).....	6
<i>Int’l Bus. Machs. Corp. v. Zynga Inc.</i> , 642 F. Supp. 3d 481 (D. Del. 2022) .....	9
<i>Intell. Ventures I LLC v. AT&amp;T Mobility LLC</i> , 235 F. Supp. 3d 577 (D. Del. 2016) .....	7
<i>Intell. Ventures I LLC v. Cap. One Bank (USA)</i> , 792 F.3d 1363 (Fed. Cir. 2015).....	18
<i>Internet Pats. Corp. v. Active Network, Inc.</i> , 790 F.3d 1343 (Fed. Cir. 2015).....	7
<i>Parker v. Flook</i> , 437 U.S. 584 (1978) .....	9, 13, 17
<i>RecogniCorp, LLC v. Nintendo Co.</i> , 855 F.3d 1322 (Fed. Cir. 2017).....	1, 7, 15, 16
<i>SAP Am., Inc. v. InvestPic, LLC</i> , 898 F.3d 1161 (Fed. Cir. 2018).....	1, 15, 16, 17
<i>Sensormatic Elecs., LLC v. Wyze Labs, Inc.</i> , No. 2020-2320, 2021 WL 2944838 (Fed. Cir. July 14, 2021) .....	7, 18
<i>Synopsys, Inc. v. Mentor Graphics Corp.</i> , 839 F.3d 1138 (Fed. Cir. 2016).....	12
<i>Trading Techs. Int’l, Inc. v. IBG LLC</i> , 921 F.3d 1378 (Fed. Cir. 2019).....	17
<i>Voit Techs., LLC v. Del-Ton, Inc.</i> , 757 F. App’x 1000 (Fed. Cir. 2019).....	18
<i>Zimmerman v. Corbett</i> , 873 F.3d 414 (3d Cir. 2017) .....	6

## Rules

Fed R. Civ. P. 12.....	2
------------------------	---

## I. INTRODUCTION AND SUMMARY OF ARGUMENT

HMD moves to dismiss VoiceAge’s claims of patent infringement for two asserted patents—U.S. Patent Nos. 8,990,073 (“the ’073 Patent”) (D.I. 1-4) and 9,852,741 (“the ’741 Patent”) (D.I. 1-5)—because their claims are directed to patent-ineligible abstract ideas.<sup>1</sup>

The ’073 Patent claims “[a] method [(or device)] for estimating a tonal stability of a sound signal.” “Tonal stability” generally refers to the presence of stable harmonics often associated with music, and the claims call for estimating “tonal stability” by performing a series of mathematical calculations. That is just an abstract algorithm to analyze a signal, and the claims are either directed exclusively to this algorithm—disembodied from any structure—or a generic “device” that performs the math. There is no patent-eligible output, or any improvement of the functionality of the generic “device.” *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016) and *In re Bd. of Trs. of Leland Stanford Junior Univ.*, 991 F.3d 1245 (Fed. Cir. 2021) are on point, which demonstrate that claiming mathematical steps to analyze a signal is firmly patent-ineligible.

Likewise, the ’741 Patent claims a “[a] method [(or device)] to encode [(or decode)] a sound signal.” Specifically, the claims recite a mathematical process to convert certain parameters used to characterize a sound signal from one sampling rate to another sampling rate, and then encode or decode those parameters into or from a bitstream (for transmission). That is just two abstract ideas claimed together: using an abstract algorithm (to convert the sampling rate) and encoding or decoding a signal. But as *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161 (Fed. Cir. 2018) and *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322 (Fed. Cir. 2017) demonstrate, using math to produce parameters, and encoding and decoding that data, are each just abstract ideas. There is nothing patent eligible in these claims either.

---

<sup>1</sup> Specifically, HMD challenges all asserted claims of the ’073 Patent (claims 1-3, 6, 10-17, 20, 30-32, 34, 36-39, and 41), and ’741 Patent (claims 1, 2, 5-8, 10-15, and 17-26).

The asserted claims of the '073 and '741 Patents should be declared invalid under 35 U.S.C. § 101, and VoiceAge's claims of patent infringement for those two patents should be dismissed.<sup>2</sup>

## II. NATURE AND STAGE OF THE PROCEEDINGS AND STATEMENT OF FACTS

The patents-at-issue here concern voice-audio codecs on mobile devices that allow speech to be transmitted in near-real time during phone calls. During a call, sounds are picked up by a mobile device's microphone and converted from an analog electrical signal into a digital (sampled) bitstream so that it can be stored in or transmitted over computerized systems. '741 Patent at 1:39-40, Fig. 1). An encoder breaks up the (digital) sound signal into short segments called "frames," and processes each frame using various algorithms. The goal is to encode the sound signal in a way that maximizes sound quality (so a caller's voice sounds more natural), while reducing as much as possible the amount of data needed to represent the sound (to limit the bandwidth needed for transmission, particularly for devices operating in bandwidth-limited environments). When the sound is transmitted to the listener, a "speech decoder ... operates on the transmitted ... bit stream and converts it back into a sound signal." '741 Patent at 1:45-47.

The Court has already issued a claim construction order in this matter. (D.I. 127.) For the '073 Patent, the parties agreed—and the Court adopted—that the preambles of certain claims are limiting, and that several claims should be construed to correct a typographical error (a duplicate recitation of "tonal stability"). (*Id.* at 5.) For the '741 Patent, the parties likewise agreed—and the Court adopted—that one term should be construed to also correct a typographical error ("transformiiii"). (*Id.*)

---

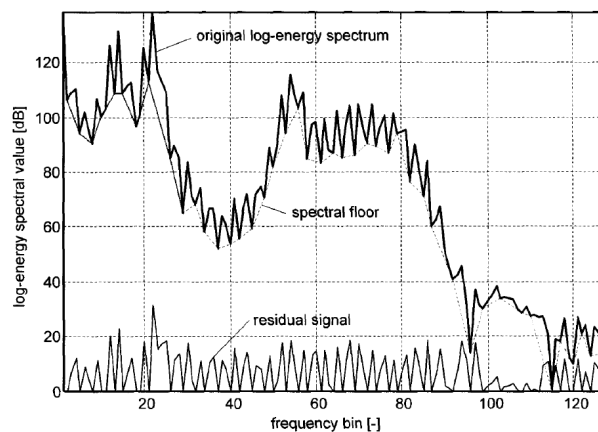
<sup>2</sup> Rule 12(c) motions are permitted if filed "early enough not to delay trial." Fed R. Civ. P. 12(c). The parties are still in fact discovery (which has just been extended), dispositive motions are not due until January 2025, and trial is scheduled for September 2025. (D.I. 180). Resolution of this motion will not delay trial, but will instead simplify the issues for trial.

## A. The '073 Patent

### 1. Overview

To balance quality and data demands, the '073 Patent notes that frames can be encoded differently—using different amounts of data—based on the type of sound in the frame. '073 Patent at 2:21-27. While frames with speech sounds may require more data, for instance, frames with just background noise may require little to no data (because background noises are inconsequential to a call). *Id.* at 2:27-34. To accomplish this variable encoding, an encoder can classify the type of sound in each frame. The '073 Patent alleges that encoders often misclassify music as a type of speech,<sup>3</sup> meaning the music will be encoded using the wrong algorithms which, according to the patent, “severely affects the music quality.” *Id.* at 2:39-46, 16:54-56.

The '073 Patent asserts that encoders can “exploit[] the tonal nature of music signals” because music often has “tones which are stable over several consecutive frames.” *Id.* at 16:58-63. A stable “tone” may exist when the peaks in a frequency graph stay relatively consistent for several frames, *id.* at 16:59-63. An example frequency graph is shown below:



*Id.* at Fig. 3. According to the '073 Patent, an encoder can track these peaks to determine whether

<sup>3</sup> The '073 Patent explains that music can be confused with “unvoiced” sounds, *see, e.g., id.* at 2:39-42, 16:54-56, which are consonant-like sounds (e.g., “ch,” “ss,” “sh,” “tt”) that can be made without activating the vocal cords.



there is sufficient “tonal stability” to better distinguish music from speech. *Id.* at Abstract, 1:26-32, 2:46-53, 16:61-65, 17:64-66.

To estimate “tonal stability,” the ’073 Patent explains that, first, a frame’s “residual spectrum” is calculated. *Id.* at 17:10-52, Fig. 3. Then, “correlation maps” are calculated, which essentially just track the location and/or shapes of the peaks in the residual signal over multiple frames to determine whether the peaks remain “stable” over time. *Id.* at 17:53-19:10, Fig. 4. If the peaks remain sufficiently “stable,” that may indicate that the frame contains music (because musical notes generally have consistent tones that span several frames). *See id.* at 18:65-67. Otherwise, the frame may be some other type of sound.

## **2. Prosecution History**

The prosecution of the ’073 Patent involved a restriction, followed by prior-art rejections that were overcome by amending the claims. *See generally* Ex. 1.<sup>4</sup> The Examiner never addressed the application of § 101 to the claims.

### **B. The ’741 Patent**

#### **1. Overview**

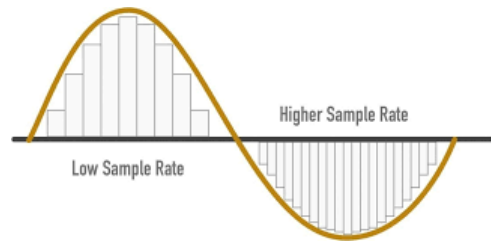
The ’741 Patent is directed to certain speech-coding filter parameters that are used for encoding/decoding a transition between frames with different sampling rates.<sup>5</sup> *See, e.g.,* ’741 Patent at Abstract; 1:16-20. The ’741 Patent explains how different “frames” of a speech signal may use different rates depending on the nature of the sound signal being encoded and the bandwidth available to transmit the signal over a network (because transmitting a sound with a

---

<sup>4</sup> It is permissible to rely on the prosecution histories when addressing § 101 on the pleadings. *See Data Engine Techs. LLC v. Google LLC*, 906 F.3d 999, 1008 n.2 (Fed. Cir. 2018).

<sup>5</sup> “Sampling rate” is the number of measurements taken per unit of time of an analog signal to convert it to a digital signal. For instance, a “sampling rate” of 16kHz means an analog signal was measured 16,000 times per second to create the digital representation of the analog signal.

higher sampling rate requires more data). *Id.* at 2:24-57. The image below shows at a high-level how an analog sound wave can be sampled at different rates:



But because speech coders will use parameters (such as linear prediction “LP” filter parameters) calculated based on past frames to “predict” and encode/decode future frames, if two frames have different sampling rates, the filter may not line up properly between the two frames. *Id.* at 2:14-23. The ’741 Patent states that LP filter parameters calculated at one sampling rate (“S1”) need to be converted to match the sampling rate of the frame to which it is being applied (“S2”). *Id.* at 2:58-60. The ’741 Patent then claims a process to convert these filter parameters by performing various mathematical calculations so that the filter parameters can apply to a frame with a sampling rate different from the frame used to calculate the parameter in the first instance. *See, e.g., id.* at cls. 1, 10, 17, 22.

## 2. Prosecution History

During prosecution of the ’741 Patent, the Examiner rejected the pending claims as being directed to unpatentable subject matter under 35 U.S.C. § 101. Ex. 2 at VAEVS\_0006529-31. Independent claim 1, for instance, at the time claimed:

A method implemented in a sound signal encoder... comprising:

[1] computing, at the sampling rate S1, a power spectrum of a LP synthesis filter using the LP filter parameters;

[2] modifying the power spectrum of the LP synthesis filter to convert it from the sampling rate S1 to the sampling rate S2;

[3] inverse transforming the modified power spectrum of the LP synthesis filter to determine autocorrelations of the LP synthesis filter at the sampling rate S2; and

[4] using the autocorrelations to compute the LP filter parameters at the sampling rate S2. *See, e.g., id.* at 6511.

In response to the § 101 Rejection, the Applicant amended the claims to add a new mathematical step: “producing ... parameters for encoding the sound signal,” including “linear predictive (LP) filter parameters,” wherein the new “producing” step comprises “converting the LP filter parameters” from a first to a second sampling rate by performing the previously recited computing, modifying, and transforming steps, and then “encoding the sound signal encoding parameters into a bitstream.” *See id.* at 6556. The Applicant argued that these amendments provide “meaningful limits to practicing the alleged abstract idea” because “the conversion of LP filter parameters from sampling rate S1 to sampling rate S2 is used to produce the sound signal encoding parameters.” *Id.* at 6565. The Applicant further argued that the amended claims apply the sample-rate conversion “in a real-world practical application consisting of encoding a sound signal by producing sound signal encoding parameters,” which “improves the functioning of a technology of encoding a sound signal.” *Id.* at 6566.

The Examiner withdrew the § 101 rejection without explanation and allowed the claims after an Examiner’s Amendment incorporated certain dependent claims (also rejected under § 101 in the May 9, 2016 Office Action) into the independent claims. *See generally id.* at 6584-95.

### **III. LEGAL STANDARDS**

#### **A. Judgment On the Pleadings Under Rule 12(c)**

“The purpose of judgment on the pleadings is to dispose of claims where the material facts are undisputed and judgment can be entered on the competing pleadings and exhibits thereto, and documents incorporated by reference.” *Int’l Bus. Machs. Corp. v. Groupon, Inc.*, 289 F. Supp. 3d 596, 600 (D. Del. 2017) (citations omitted). “A motion for judgment on the pleadings should be granted if the movant establishes that there are no material issues of fact,

and [the movant] is entitled to judgment as a matter of law.” *Zimmerman v. Corbett*, 873 F.3d 414, 417 (3d Cir. 2017) (internal quotation marks and citations omitted). “In considering a motion for judgment on the pleadings, a court must accept all of the allegations in the pleadings of the party against whom the motion is addressed as true and draw all reasonable inferences in favor of the non-moving party.” *Id.* at 417-18 (citations omitted). Claims are often invalidated under § 101 on the pleadings. *See, e.g., CG Tech. Dev., LLC v. FanDuel, Inc.*, 442 F. Supp. 3d 840, 850 (D. Del. 2020), *aff’d*, 858 F. App’x 363 (Fed. Cir. 2021); *Intell. Ventures I LLC v. AT&T Mobility LLC*, 235 F. Supp. 3d 577, 598 (D. Del. 2016).

## **B. Patent Eligibility Under § 101**

The Supreme Court has prescribed a two-step framework to determine whether a claim is patent ineligible under § 101. *See Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208 (2014).

First, courts must examine the claim’s “character as a whole” to determine if it is “directed to excluded subject matter” such as an abstract idea. *See, e.g., Internet Pats. Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015). Claiming mathematical formulas or processes for encoding/decoding signals have long been held to be directed to abstract ideas. *See, e.g., In re Bd. of Trs. of Leland Stanford Junior Univ.*, 991 F.3d 1245, 1250 (Fed. Cir. 2021) (“[M]athematical algorithms for performing calculations, without more, are patent ineligible under § 101.”); *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1326 (Fed. Cir. 2017) (“[S]tandard encoding and decoding [is] an abstract concept long utilized to transmit information.”); *Sensormatic Elecs., LLC v. Wyze Labs, Inc.*, No. 2020-2320, 2021 WL 2944838, at \*3 (Fed. Cir. July 14, 2021) (“[E]ncoding or decoding image data is abstract, even if for the purpose of transmitting files to devices with less memory or bandwidth or by transcoding data into multiple formats.”). Such abstract ideas are considered unpatentable “no matter how groundbreaking, innovative, or even brilliant” the idea may be. *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1352

(Fed. Cir. 2014) (citation omitted).

If the claims are directed to an abstract idea, courts must then examine whether the claim contains “significantly more” than that abstract idea. *Alice*, 573 U.S. at 217. Merely implementing an abstract idea using generic computers or in specific fields are legally insufficient. *See Data Engine Techs. LLC v. Google LLC*, 906 F.3d 999, 1010, 1012 (Fed. Cir. 2018); *see also Alice*, 573 U.S. at 222. Rather, “significantly more” requires that the additional limitations “‘transform the nature of the claim’ into a patent-eligible application” of the underlying abstract idea. *Alice* at 217.

#### **IV. ARGUMENT**

##### **A. The ’073 Patent Is Invalid Under § 101**

At base, the claims of the ’073 Patent are directed to an algorithm to estimate a property of a sound signal (so called “tonal stability”). But the ability to perceive stable tones in sounds and thereby identify tonal music has been a quintessential human feat since music’s advent. Humans do it all the time with their ears and brains. Providing a mathematical process that would allow computers to identify this same “tonal stability” in a musical sound signal is not patentable.

##### **1. *Alice* Step One: Estimating “Tonal Stability” Using Math Is an Abstract Idea**

Every asserted claim of the ’073 Patent is directed (as a method or device) to “estimating a tonal stability of a sound signal” by performing a series of mathematical calculations.<sup>6</sup> For the independent claims, those calculations include: (1) “*calculating* a current residual spectrum” to eliminate noise and other signal variables; (2) “*detecting* a plurality of peaks” using math; (3) “*calculating* a correlation map” of the detected peaks over time; and (4) “*identifying* the tonal stability of the sound[.]” *See, e.g.,* ’073 Patent at cls. 1, 30, 31 (emphasis added). That is simply an algorithm to identify stable tones in a sound signal, which is an abstract idea. The claims

---

<sup>6</sup> Independent claim 1 can be treated as exemplary for purposes of this motion.

therefore fail under *Alice* step one.

Over the last half-century, the courts have drawn a distinct line between claims that are directed to abstract algorithms and those to patent-eligible inventions that incorporate an algorithm. On one side are cases like *Gottschalk v. Benson*, 409 U.S. 63 (1972) and *Parker v. Flook*, 437 U.S. 584 (1978), in which the Supreme Court “[r]eason[ed] that an algorithm, or mathematical formula, is like a law of nature” and not patent eligible as a “process” under § 101. *Flook*, 437 U.S. at 589; *see also id.* at 585-86, 594-95 (finding claims to updating an “alarm limit” using an equation an unpatentable algorithm); *Gottshalk*, 409 U.S. at 65, 71 (finding “a method of programming a general-purpose digital computer to convert signals from binary-coded decimal form into pure binary form” an unpatentable algorithm). On the other side are cases like *Diamond v. Diehr*, 450 U.S. 175 (1981), which found that claims to otherwise patentable subject matter that incorporated an algorithm was sufficient to pass § 101, *id.* at 179 n.5, 184 (finding claims to a method of curing rubber that controlled cure time using an algorithm were patentable).

While claims have gotten more sophisticated, this line—between claims to mere algorithms and claims that use algorithms for specified activities—has held firm. In *Electric Power*, for instance, the Federal Circuit found that claims to “[a] method of detecting events on an interconnected electrical power grid” that monitored data, used an algorithm to identify events, and outputted the results were abstract ideas because they merely used “existing computers as tools in aid of processes focused on ‘abstract ideas.’” 830 F.3d at 1351, 1354. The Federal Circuit then contrasted the claims-at-issue with those presented in another case—*Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016)—which it found patentable under § 101 because they “focused not on asserted advances in uses to which existing computer capabilities could be put, but on a specific improvement—a particular database technique—in how computers could carry

out their basic functions.” *Elec. Power*, 830 F.3d at 1354; *see also Int’l Bus. Machs. Corp. v. Zynga Inc.*, 642 F. Supp. 3d 481, 486, 490 (D. Del. 2022) (drawing a similar distinction from *Enfish*, finding an algorithm directed to an abstract idea). Claims that simply implement algorithms on a computer—rather than improve the computer’s operation itself—are abstract ideas under § 101.

Applying this principle, the Federal Circuit has continued to find claims to pure algorithms implemented on generic computers abstract. In *Stanford*, for instance, the Federal Circuit found that claims directed to “[a] computerized method for inferring haplotype phase [(e.g., the relationships of DNA variants in a population)]” were patent ineligible because they were directed to “the use of mathematical calculations and statistical modeling” that was simply implemented on “a regular computer.” 991 F.3d. at 1247-48, 1250. While the patentee argued the claims were not abstract because they improved the accuracy of calculating the haplotype phase, the Federal Circuit found that “improving the accuracy of a mathematically calculated statistical prediction” is not the sort of “technological improvement” eligible for patenting. *Id.* at 1251.

And similarly, in *CardioNet, LLC v. InfoBionic, Inc.*, 816 F. App’x 471 (Fed. Cir. 2020), the Federal Circuit rejected a patentee’s argument that its claims were not directed to an abstract idea because they embodied “a new data analysis process that improves cardiac monitoring technology” in part by using mathematical formulas to generate an “entirely new metric.” *Id.* at 475. According to the Federal Circuit, even if the claims embodied a brand-new metric, “it is at most a mathematical computation performed on a general-purpose computing device” and thus remained an unpatentable abstract idea. *Id.* at 476-77.

Here, like *Electric Power*, *Stanford*, and *CardioNet*, the claims of the ’073 Patent are directed to a “metric”—an algorithm, to estimate the “tonal stability” of a sound signal, that may

be implemented on a generic computer.<sup>7</sup> The claims never specify how the estimate is to be used, or even that it be used at all. At best, that is just a series of abstract ideas presented together.

First, an algorithm to estimate “tonal stability” is itself abstract. As the ’073 specification explains:

[d]etection of tonal stability exploits the tonal nature of music signals. In a typical music signal, there are tones which are stable over [time]. To exploit this feature, it is necessary to track the positions and shapes of strong spectral peaks since these may correspond to tones. The tonal stability detection is based on a correlation analysis between the [current] spectral peaks ... and those of the past [].

’073 Patent at 16:54-65. The ’073 Patent therefore concedes that the algorithm it describes is simply replicating the human experience of recognizing stable tones attributable to music. *See also* Ex. 3 at 106:22-107:6 (named inventor agreeing that “tonal stability” is “a quality of the audio signal independent of the mechanism that might be used to record or transmit it,” and that “anyone can hear a tonal signal anywhere.”). All the ’073 Patent proposes is a mathematical way to estimate it.

That the ’073 Patent provides mathematical formulas and identifies various parameters to estimate “tonal stability” does not bring the claims out of the realm of abstraction. *See Elec. Power*, 830 F.3d at 1353-54. The claimed process—(1) calculating a residual spectrum; (2) detecting predominating peaks (or tones); (3) tracking those peaks over time; and (4) determining the stability of the detected tones—mirrors the natural human perception of stable tones in music by listening for and separating musical tones from other noises. And the ’073 Patent provides the exact equations by which “tonal stability” can be calculated using pen and paper. *See* ’073 Patent

---

<sup>7</sup> Claims 1-3, 6, 10-17, and 20 do not even require a computer; they are directed to disembodied algorithms devoid of any structure. Claims 30-32, 34, 36-39, and 41 at least require “a device.”



at 17:4-19:9, 26:3-27:16; *see also, e.g., In re Killian*, 45 F.4th 1373, 1379 (Fed. Cir. 2022) (“[Where] the claim’s character as a whole is directed to steps that can be performed in the human mind, or by a human using a pen and paper the claim is for a patent-ineligible abstract idea.”) (cleaned up). Because claims 1-3, 6, 10-17, and 20 do not recite *any* tangible structure—just the algorithm—they present nothing but the abstract idea. *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016) (finding claims directed to an abstract idea in part because “the claims do not call for any form of computer implementation of the claimed methods.”).

Second, even those claims that recite a generic “device” (claims 30-32, 34, 36-39, and 41) do not provide any “technological improvement” of the sort described in *Enfish*. Neither the claims nor specification identify any non-generic structure that is improved by performing the recited calculations. *Id.* at cls. 30-41; *see also id.* at 5:4-10, 6:26-50 (reciting only a “sound communication system” comprising a “pre-processor” and various modules). By requiring only a generic computer system that itself is in no way improved—but merely implements the claimed algorithm—the ’073 Patent “fails to circumvent the prohibition against patenting abstract ideas and mental processes.” *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012); *Elec. Power*, 830 F.3d at 1355 (finding patent-ineligible claims that “merely call for performance of the claimed information collection, analysis, and display functions on a set of generic computer components.”) (cleaned up).

The asserted dependent claims offer nothing to bring them out of the realm of abstraction. Most just recite additional mathematical processes, or details about already-recited processes, which is still just an abstract algorithm to analyze a sound signal. *See, e.g.,* ’073 Patent, cls. 2, 32 (“searching for the minima,” “estimating the spectral floor,” “subtracting the estimated spectral floor”), 3 (“locating a maximum”), 6, 34 (“detecting strong tones”). And even though claims 10

and 36 are directed to a higher-level method or device “for detecting sound activity” to classify a sound signal as either “active” or “inactive”—with the tonal-stability estimator of claims 1 and 31 baked in, respectively—the ’073 Patent itself admits that this higher-level “sound activity detector” is just another algorithm. *Id.* at 2:46-53. The claims depending from claims 10 and 31 do not add anything non-abstract, either. *See id.* at cls. 11-17, 20, 37-39, 41 (reciting additional mathematical steps such as “preventing update of noise energy estimates,” “using a signal-to-noise ratio (SNR)-based sound activity detection,” “detecting the sound signal”)).

The claims of the ’073 Patent are directed to an abstract idea and fail at step one.

## 2. ***Alice* Step Two: The Claims Add Nothing But Patent-Ineligible Math and Generic Computers**

Because the ’073 Patent claims are directed to performing mathematical calculations in the abstract (claim 1-3, 6, 10-17, and 20), or on a generic computer (claims 30-32, 34, 36-39, and 41), they contain nothing that renders them patent eligible. When a claim is directed to mathematical computations, “[t]o salvage an otherwise patent-ineligible process, a computer must be integral to the claimed invention, facilitating the process in a way that a person making calculations or computations could not.” *Bancorp Servs.*, 687 F.3d at 1278. But “***[t]he process itself, not merely the mathematical algorithm, must be new and useful.*** Indeed, the novelty of the mathematical algorithm is not a determining factor at all.” *Flook*, 437 U.S. at 591 (emphasis added). In performing the analysis at step two, then, the mathematical formulas are assumed part of the prior art, and the analysis turns on what else remains in the claim. *Id.*

Here, once the mathematics are set to the side, nothing remains. As stated, the method of claim 1 and its dependents are disembodied from any structure, ’073 Patent at cls. 1-3, 6, 10-17, 20, and every claimed process step is just mathematics in written form, *see generally id.* at 16:52-20:42. The same is true of the device claims; aside from the “means for” performing the claimed

computations, all that remains are generic computer components.<sup>8</sup> *Id.* at cls. 30-32, 34, 36-39, 41. That is insufficient. *See, e.g., Elec. Power*, 830 F.3d at 1355 (finding claims failed at step two because “[n]othing in the claims, understood in light of the specification, requires anything other than off-the-shelf, conventional computer....”); *CardioNet*, 816 F. App’x at 477 (“Because the claim limitations ... amount only to implementations of abstract ideas using conventional technology, we conclude that the claims do not include an inventive concept sufficient to transform the claims into patent-eligible applications.”). And “if a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.” *In re Richman*, 563 F.2d 1026, 1030 (C.C.P.A. 1977).

Accordingly, asserted claims of the ’073 Patent should be declared invalid under § 101 and VoiceAge’s claim of patent infringement dismissed.

## **B. The ’741 Patent Is Invalid Under § 101**

### **1. *Alice* Step One: Converting Sampling Rates and Encoding Parameters are Abstract Ideas**

Like the ’073 Patent, the asserted claims of the ’741 Patent should be declared invalid under § 101 because each is directed to a method or generic device for converting parameters from one sample rate to another.<sup>9</sup> The independent claims recite steps that include: (1) “producing [certain] parameters for encoding the sound signal” (claim 1, 17) or “receiving a bitstream” of encoded parameters (claims 10, 22); and (2) “converting the [] parameters” from one sampling rate to another by: (i) “computing ... a power spectrum”; (ii) “modifying the power spectrum”; (iii) “inverse transforming the modified power spectrum”; and (iv) “encoding the [] parameters

---

<sup>8</sup> While independent claim 31 recites “calculator[s]” and “detector[s]” as if they were concrete structure, these are simply modules operating on a generic processor.

<sup>9</sup> Independent claim 1 can be treated as exemplary for purposes of this motion.

into a bitstream” (claim 1, 17) or “decoding the bitstream” (claim 10, 22). ’741 Patent at cls. 1, 10, 17, 22. These purely mathematical manipulations are an abstract idea.

As discussed previously, “analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, [are] essentially mental processes within the abstract-idea category.” *Elec. Power*, 830 F.3d at 1354. So too is “standard encoding and decoding,” which has “long [been] utilized to transmit information.” *RecogniCorp*, 855 F.3d at 1326 ; *see also id.* (“Morse code, ordering food at a fast food restaurant via a numbering system, and Paul Revere’s ‘one if by land, two if by sea’ signaling system all exemplify encoding at one end and decoding at the other end.”); *Sensormatic*, 2021 WL 2944838, at \*3 (“The concept of encoding or decoding image data is abstract, even if for the purpose of transmitting files to devices with less memory or bandwidth or by transcoding data into multiple formats.”); *Adaptive Streaming Inc. v. Netflix, Inc.*, 836 F. App’x 900, 903 (Fed. Cir. 2020) (same). Moreover, simply “[a]dding one abstract idea (math) to another abstract idea (encoding and decoding) does not render the claim non-abstract.” *Id.*

During prosecution, the Examiner rightly found each of the ’741 Patent application claims was directed to an abstract idea because each involves performing a series of mathematical calculations to convert signal parameters from one form (parameters for a frame at one sampling rate) to another (parameters for a frame at a different sampling rate). Ex. 2 at 6529-31. The Applicant did not even dispute that characterization. *See id.* at 6564-66. The Examiner erred, however, by then withdrawing the rejection in view of the Applicant’s subsequent claim amendment—which added only that math is used to encode “parameters” into a bitstream for transmission. *See id.* The Federal Circuit has made clear that is not enough.

In *SAP*, for instance, the Federal Circuit analyzed claims directed to systems and methods for analyzing investment information and generating “a distribution function using a resampled statistical method and a bias parameter” and then generating plots of the distribution function. *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1164-65 (Fed. Cir. 2018). According to the Federal Circuit, even though the claims produced a tangible output in the form of parameters and plots, “merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis.” *Id.* at 1167 (cleaned up). Indeed, the Federal Circuit explained that “[n]o matter how much of an advance in the finance field the claims recite, the advance lies entirely in the realm of abstract ideas, with no plausibly alleged innovation in the non-abstract application realm.” *Id.* at 1163.

Likewise, in *Stanford* (discussed previously), the Federal Circuit found the claims directed to an abstract idea even though the claims modifying various computerized parameters to infer haplotype phase. 991 F.3d at 1247-48, 1252. Consistently, the Federal Circuit in *Gopalan* found that optimizing parameters to find “true positives” and avoid “false positives” in a dataset was also directed to an abstract idea. *In re Gopalan*, 809 F. App’x 942, 946 (Fed. Cir. 2020). The exact same is true here.

The asserted claims as a whole are directed to the abstract idea of converting signal parameters from one sampling rate to another using math. *See SAP*, 898 F.3d at 1163-65; *Stanford*, 991 F.3d at 1247-48, 1252; *Gopalan*, 809 F. App’x at 946. And even though the ’741 claims—unlike the ’073 claim—provide an output (such as producing parameters and/or encoding or decoding a bitstream), those outputs alone are insufficient to bring the claims out of the realm of

abstraction; it is simply stacking one abstract idea (using math to convert parameters) onto another (encoding/decoding data). *See RecogniCorp*, 855 F.3d at 1327.

The asserted dependent claims offer nothing to bring them out of the realm of abstraction either. They each just recite additional mathematical processes, or details about already-recited processes, which is still just an abstract algorithm to convert the sampling rates for signal parameters. *See, e.g.*, '741 Patent, cls. 2, 11, 18, 23 (dividing frames into subframes and “comput[ing] LP filter parameters for each subframe”), 5, 12 (“the power spectrum ... is a discrete power spectrum”), 6, 13, 19, 24 (“comput[ing] the power spectrum,” “extend[ing] the power spectrum,” “truncat[ing] the power spectrum”), 7, 14, 20, 25 (“comput[ing] the power spectrum”), 8, 15, 21, 26 (“inverse transforming the modified power spectrum”).

The '741 Patent claims are therefore directed to an abstract idea under *Alice* step one.

## 2. *Alice* Step Two: The Claims Do Not Recite “Significantly More”

Once again, at step two, “the novelty of the mathematical algorithm is not a determining factor at all” and is treated as part of the prior art to determine *what else* in the claim remains to bring them out of the realm of abstraction. *Flook*, 437 U.S. at 591-92.

Here, just like the '073 Patent, the claims do not provide any tangible improvement of patent-eligible subject matter. To start, the methods of claims 1, 2, 5-8, and 10-15 do not recite any tangible medium to perform the recited encoding/decoding; these steps can be performed using pen and paper. *Killian*, 45 F.4th at 1379.

But even for the “devices” of claims 17-26, the '741 Patent explains that “the components, process operations, and/or data structures described herein may be implemented using ... **general purpose machines**.” '741 Patent at 12:55-59; *see also id.* at Fig. 5 (showing only generic components of signal inputs and outputs, and a generic processor and memory). “[S]imply implementing a mathematical principle on a physical machine, namely a computer, [i]s not a

patentable application of that principle.” *Alice*, 573 U.S. at 222 (citation omitted). Accordingly, “the focus of the claims is not a physical-realm improvement but an improvement in wholly abstract ideas—the selection and mathematical analysis of information[.]” *SAP*, 898 F.3d at 1168; *Trading Techs. Int’l, Inc. v. IBG LLC*, 921 F.3d 1378, 1385 (Fed. Cir. 2019) (“The abstract idea itself cannot supply the inventive concept, no matter how groundbreaking the advance.”).

While VoiceAge may argue that the claimed mathematical processes improve the computer’s efficiency, *see, e.g.*, ’741 Patent at 2:58-60, that is not enough. “[M]erely calling for a mathematical concept to be performed more efficiently or with a particular input does not amount to an application of the mathematical concept that is patent-eligible.” *In re Gitlin*, 775 F. App’x 689, 691 (Fed. Cir. 2019); *see also Voit Techs., LLC v. Del-Ton, Inc.*, 757 F. App’x 1000, 1003-04 (Fed. Cir. 2019) (“[C]laims directed to improved speed or efficiency inherent with applying the abstract idea on a computer are insufficient to demonstrate an inventive concept.”) (quoting *Intell. Ventures I LLC v. Cap. One Bank (USA)*, 792 F.3d 1363, 1367 (Fed. Cir. 2015)); *Sensormatic*, 2021 WL 2944838, at \*3 (“[E]ncoding or decoding image data is abstract, even if for the purpose of transmitting files to devices with less memory or bandwidth or by transcoding data into multiple formats.”).

Thus, the ’741 Patent fails to provide an inventive concept to patent-eligible subject matter sufficient to render the claims as a whole patent-eligible. Accordingly, the ’741 Patent claims should be declared invalid under § 101 and VoiceAge’s claim of patent infringement dismissed.

## V. CONCLUSION

For the foregoing reasons, the ’073 and ’741 Patents should be declared invalid under § 101, and VoiceAge’s claims of infringement for those patents should be dismissed.

OF COUNSEL:

William J. McCabe  
Matthew J. Moffa  
Thomas V. Matthew  
Matthew A. Lembo  
PERKINS COIE LLP  
1155 Avenue of the Americas, 22nd Floor  
New York, NY 10036-2711  
(212) 262-6900

Samantha Hunt  
PERKINS COIE LLP  
1201 Third Avenue, Suite 4900  
Seattle, WA 98101-3099  
(206) 359-8000

Roderick O'Dorisio  
PERKINS COIE LLP  
1900 Sixteenth Street, Suite 1400  
Denver, CO 80202  
(303) 291-2303

Olivia S. Radics  
PERKINS COIE LLP  
33 East Main Street, Suite 201  
Madison, WI 53703-3095  
(608) 663-7460

Dated: February 29, 2024

/s/ Nathan R. Hoeschen

John W. Shaw (No. 3362)  
Nathan R. Hoeschen (No. 6232)  
SHAW KELLER LLP  
I.M. Pei Building  
1105 North Market Street, 12th Floor  
Wilmington, DE 19801  
(302) 298-0700  
jshaw@shawkeller.com  
nhoeschen@shawkeller.com  
*Attorneys for Defendant*